

# PATENT SPECIFICATION

## DRAWINGS ATTACHED

841,609



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International Classification:—D01b.

### COMPLETE SPECIFICATION

#### Carding Apparatus

I, RALPH AUSTIN RUSCA, of 6530, General Haig Street, New Orleans, Louisiana, United States of America, a Citizen of the United States of America, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed to be particularly described in and by the following statement:—

This invention relates to an improvement in or modification of the invention described and claimed in Patent Application No. 179/1958 (Serial No. 836668).

In general, the object of this invention is achieved by providing pre-opener roll means mounted in a fibre-opening and transfer relationship with the main carding cylinder at a point at which said means will operate upon fibres before they reach the non-loading granular carding surfaces. Said pre-opener roll means may comprise at least one toothed pre-opener roll having its axis parallel to the axis of the main cylinder.

One embodiment of the invention is described in detail below, reference being made to the accompanying drawings in which

Figure 1 is a side elevation of a conventional carding machine in which the revolving flats and their auxiliary operating mechanism are replaced by the stationary granular carding plates of Patent Application No. 179/1958 (Serial No. 836668), and which is modified in accordance with the present invention.

Figure 2 is a sectional view taken through the pre-opener rolls showing their special relationship at the other elements of the machine.

Figure 3 is an enlarged view of the mounting screws for the granular carding plates.

Figure 4 is a portion of a perspective view of the apparatus showing the relationship of the pre-opener rolls to the granular carding plates.

Figure 5 is an exploded perspective view of the preopener rolls, brackets, bushings, [Price 3s. 6d.]

and cover plates.

Figure 6 is a sectional view of an embodiment having a single pre-opener roll, showing its relationship with the other elements of the machine.

Figure 7 is a side elevation of the carding machine at location of the single pre-opener roll.

Figure 8 is a perspective view of the bearing and Figure 9 is a similar view of the cover plate for the single pre-opener roll.

As seen from Figure 1, the apparatus resembles the conventional carding machine in that it has the usual carding cylinder 10, lickerin 11, and doffer 12. However, the revolving flats and their accompanying mechanism have been eliminated and replaced by a stationary cover comprising a plurality of similar carding plates 13 as described in Patent Application No. 179/1958 (Serial No. 836668). In addition, at a position just above the lickerin 11, a pair of saw tooth rolls 14 and 14', which extend completely across the cylinder, have been added. The rolls 14 and 14' are mounted in bearings 24 at each end supported in brackets 25, which fasten to the frame of the carding machine.

The rolls are individually driven by belts (not shown) from other units of the machine or one roll 14' may be driven from the machine by means of a pulley 37 (Fig. 4) and a belt (not shown) which in turn can be connected by belts or a set of gears 23 to drive the other roll 14. Any conventional means can be used for mounting the rolls in such a way that they are adjustable to each other and to the cylinder. The rolls can be of the same diameter or of different diameters, practical limits being from 2" to 7" diameter. The rolls are preferably covered with saw type teeth which have a rake in one direction. The rolls are enclosed by a cover plate 15 which is contoured top and bottom to the shape of the rolls and extends from the back knife plate 16 to the granular

carding plate 13.

Figure 2 shows the arrangement for a pair of pre-opener rolls installed on a carding machine with the granular carding plates.

- 5 The top roll 14, rotates in either direction at a relatively slow speed (30 rpm), the preferred direction, however, is clockwise as viewed. The bottom roll 14' rotates counter-clockwise as viewed in Figure 2, at a faster speed (450 rpm). A back plate 16 encloses the main cylinder from the lickerin up to the pre-opener rolls. The preferred teeth on the rolls are approximately 175 teeth per square inch, with a 30° rake angle on each tooth. Stand-
- 10 ard card fillet wire can be used with slightly inferior results. The arrangement of the carding apparatus can vary; two or more pairs of rolls can be located consecutively prior to the granular carding plates, or each pair of rolls can be followed by one or more granular carding plates.

- Referring to Figure 2, all unopened tufts of fibres are caught by the teeth of roll 14, and carried back where they are taken by roll 14' and delivered back to the main cylinder 10. As the tufts again go by roll 14, they are caught and brought back through the same cycle. Each time the tufts are caught they are opened by the action of roll 14 and the cylinder 10. In this way, the granular surface of the carding plates has only well-opened fibres to card, and can do a more thorough job.

- The pre-opener rolls have no effect on card waste, and themselves do not cause waste by becoming impacted with fibres.

- Figure 3 is an enlarged view of the method used to provide individual mounting and adjustment for the granular carding top plates as shown in Figure 1 and as described in Patent Application No. 179/1958 (Serial No. 836668). The metal pad 17 is fastened to the card frame 38 by screw 18. The mounting screws 19, are fastened to the pad by cap screw 20. Adjustment is accomplished by screwing the nuts 21 up or down. The granular carding plates are thus positioned as desired with respect to the surface of the card cylinder.

- As stated above, pre-opening of the fibre tufts can also be accomplished by a single pre-opener roll. This preferred embodiment of the invention is depicted in Figures 6 and 7.

- 55 The single pre-opener roll 36 has teeth opposing those of the main cylinder 10 and rotates at a slower surface speed in either direction. The teeth of the roll take the unopened tufts of fibre from the main cylinder 10 and carry them around to the lickerin 11 which has a higher surface speed and removes the tufts from the roll. The tufts are then carried around by the lickerin and re-deposited on the main cylinder. The roll can be of any diameter, practical limits being

2" to 7", and can be covered with metallic wire or fillet type clothing. The construction of the preferred roll is the same as shown in Figure 5. The roll may turn in either direction and at a wide range of speeds for the particular type of carding, being done. Practical limits for speed are a low of 8 rpm and a high being the rpm which gives a surface speed equal to that of the lickerin. The preferred roll turns counterclockwise as viewed in Figure 6, at a speed of 30 rpm. The roll can be driven by belt or gear train (not shown) from any convenient rotating member of the carding machine. The roll is mounted at each end in a bearing 26 held by an adjustable bracket 27, which in turn is fastened to the machine by existing cap screws 28 which ordinarily fasten makeup piece 29 to the main frame. The bearing 26 rests in a groove in bracket 27 and is held in place by clamp 30 which permits easy removal of the roll. The bearing 26 has flange 31 which provides the end closure for the roll and supports a part of cover plate 32. The cover plate 32 (see Fig. 9) provides enclosure for the lickerin 11 and for the pre-opener roll 14 and is mounted on the lickerin shroud 33 and fastened by the screws 34.

Advantages of the single pre-opener roll are simplicity of design and additional cleaning of the fibre. The unopened tufts stripped from the roll 36 by the lickerin 11 are carried over the mote knives 35 before being re-deposited on the cylinder 10, thereby making additional removal of the trash and mote possible.

When the pre-opener rolls are installed on a carding machine along with the granular carding plates, all of the advantages referred to in Patent Application No. 179/1958 (Serial No. 836668) are realized fully, and in addition, the quality of the sliver produced by the machine is further improved by a reduction in neps and better uniformity. The pre-opener rolls accomplished this by acting on the fibrous material as it is delivered to the main cylinder of the machine and presenting to the granular surface of the carding plates only well-opened fibres to card. The card thus performs a more thorough job.

#### WHAT I CLAIM IS:—

1. The improvement in or modification of the carding apparatus as claimed in Claim 1 of Patent Application No. 179/1958 (Serial No. 836668), comprising the additional feature of pre-opener roll means mounted in a fibre opening and transfer relationship with the main carding cylinder at a point at which said means will operate upon fibres before they reach the non-loading granular carding surface.

2. Carding apparatus as claimed in Claim 1, wherein said pre-opener roll means are constituted by at least one toothed pre-

opener roll having its axis parallel to the axis of the main carding cylinder.

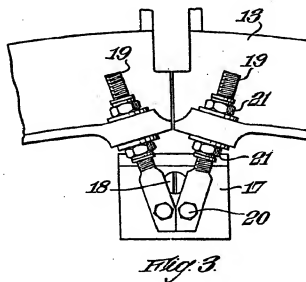
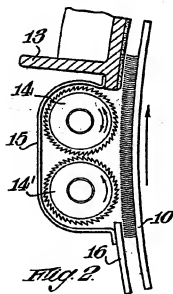
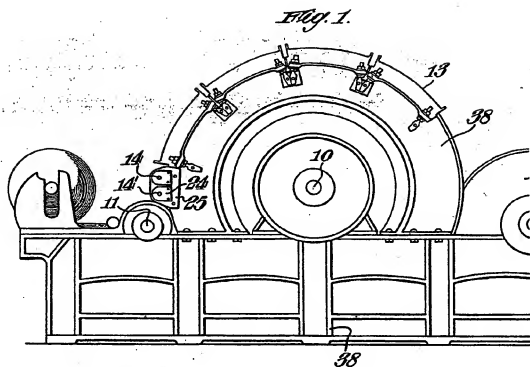
3. Carding apparatus as claimed in Claim 1, wherein the machine comprises a lickering, and wherein said pre-opener roll means is constituted by a single pre-opener roll with teeth opposing those of the main carding cylinder and with axis parallel to the main carding cylinder axis, said single pre-opener roll having a fibre opening and transfer relationship consecutively with the main carding cylinder and the lickering.

4. Apparatus as claimed in Claim 1 or claim 2, wherein the pre-opener roll means is constituted by one or more pairs of consecutively located toothed rolls.

5. Carding apparatus as claimed in Claim 4, wherein each of said pairs of rolls is followed by one or more non-loading granular carding surfaces.

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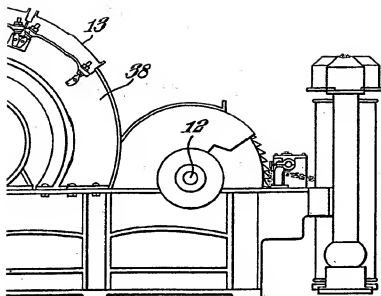
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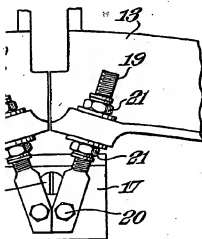
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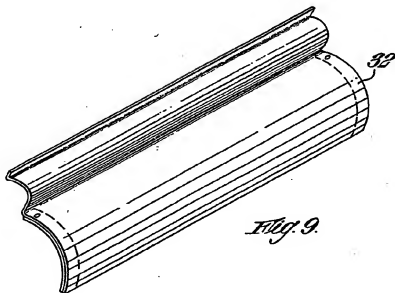
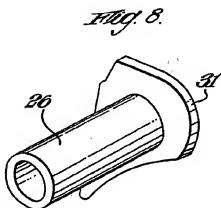
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*Fig. 8.*



*Fig. 9.*

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 SHEET 1

Fig. 1.

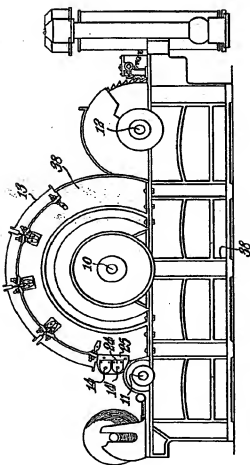


Fig. 2.



Fig. 3.

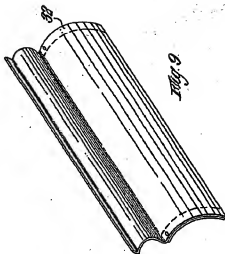


Fig. 4.

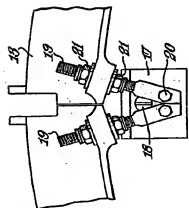
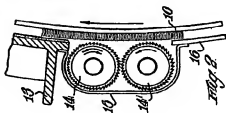


Fig. 5.



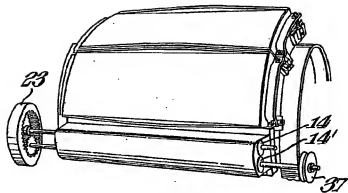
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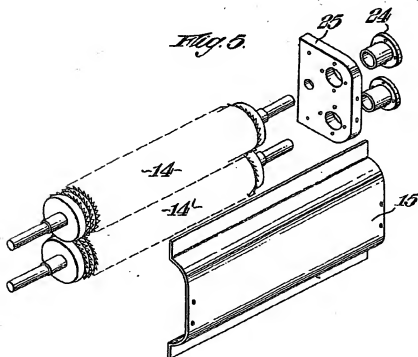
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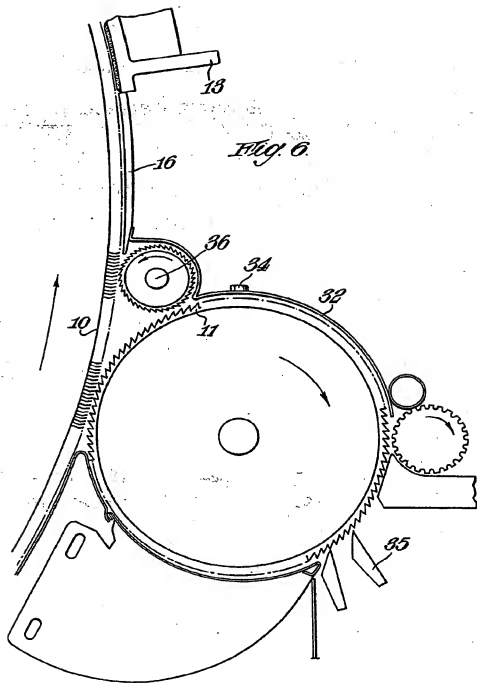
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*Fig. 4.*



*Fig. 6.*







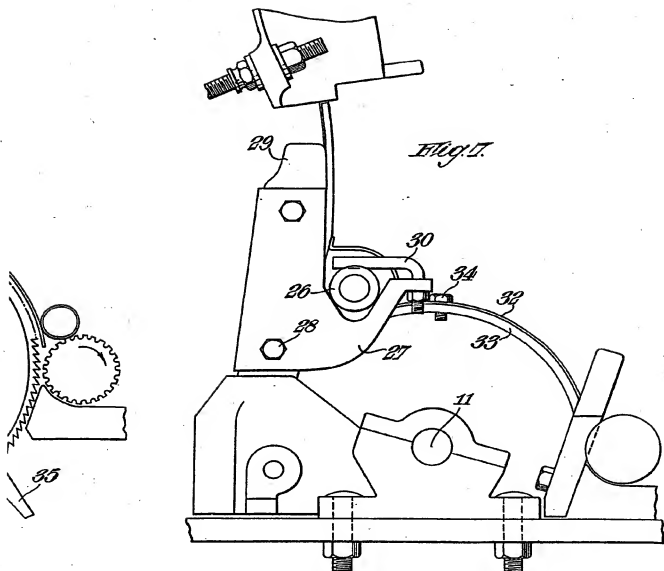
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SHEETS 3 & 4



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